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TIP120/121/122

SemiHow
Know-How for Semiconductor

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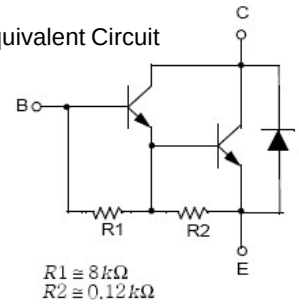
TIP120/121/122

Monolithic Construction With Built In Base-Emitter Shunt Resistors

- High DC Current Gain : hFE=1000 @ VCE= 4V, IC= 3A (Min.)
- Collector-Emitter Sustaining Voltage
- Low Collector-Emitter Saturation Voltage
- Industrial Use
- Complementary to TIP125/126/127

PNP Epitaxial Silicon Darlington Transistor

Equivalent Circuit



$R1 \cong 8k\Omega$
$R2 \cong 0.12k\Omega$

TO-220
1. Base
2. Collector
3. Emitter

Absolute Maximum Ratings T_a=25℃ unless otherwise noted

CHARACTERISTICS	SYMBOL	RATING	UNIT
Collector-Base Voltage : TIP120	V_{CBO}	60	V
: TIP121		80	V
: TIP122		100	V
Collector-Emitter Voltage : TIP120	V_{CEO}	60	V
: TIP121		80	V
: TIP122		100	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current(DC)	I_C	5	A
Collector Current(Pulse)	I_{CP}	8	A
Base Current	I_B	120	mA
Collector Dissipation(Ta=25℃)	P_C	2	W
Collector Dissipation(Tc=25℃)	P_C	65	W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-65~150	℃

Electrical Characteristics T_a=25℃ unless otherwise noted

CHARACTERISTICS	SYMBOL	Test Condition	Min	Max	Unit
Collector-Emitter Sustaining Voltage	V_{CEO}(SUS)				
: TIP120		I_C=100mA, I_B=0	60		V
: TIP121			80		V
: TIP122			100		V
Collector Cut-off Current	I_{CEO}				
: TIP120		V_{CE}=30V,I_B=0		0.5	mA
: TIP121		V_{CE}=40V,I_B=0		0.5	mA
: TIP122		V_{CE}=50V,I_B=0		0.5	mA
Collector Cut-off Current	I_{CBO}				
: TIP120		V_{CE}=60V,I_E=0		0.2	mA
: TIP121		V_{CE}=80V,I_E=0		0.2	mA
: TIP122		V_{CE}=100V,I_E=0		0.2	mA
Emitter Cut-off Current	I_{EBO}	V_{EB}=5V,I_C=0		2	mA
DC Current Gain	h_{FE}	V_{CE}=3V,I_C=0.5A	1000		
		V_{CE}=3V,I_C=3A	1000		
Collector-Emitter Saturation Voltage	V_{CE}(sat)	I_C=3A,I_B=12mA		2	V
		I_C=5A,I_B=20mA		4	V
Base-Emitter ON Voltage	V_{BE}(on)	V_{CE}=3V,I_C=3A		2.5	V
Output Capacitance	C_{ob}	V_{CB}=10V,I_E=0, f=0.1MHz		200	pF

* Pulse Test: PW≤300us, Duty Cycle≤2%

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Typical Characteristics

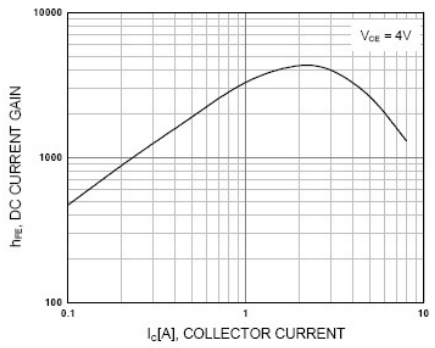

Figure 1. DC current Gain

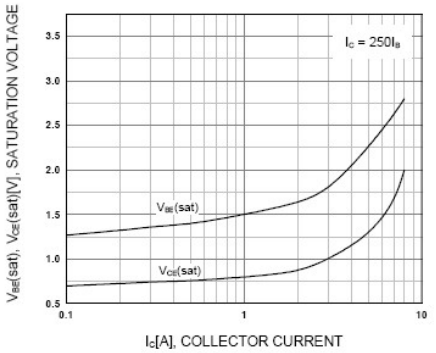

Figure 2. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

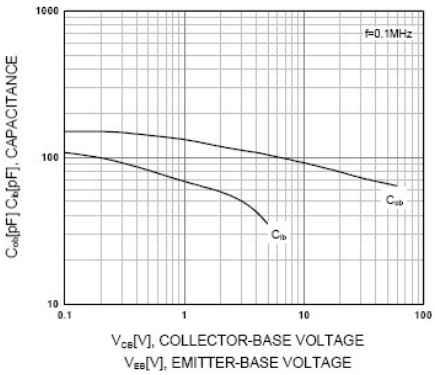

Figure 3. Output and Input Capacitance vs. Reverse Voltage

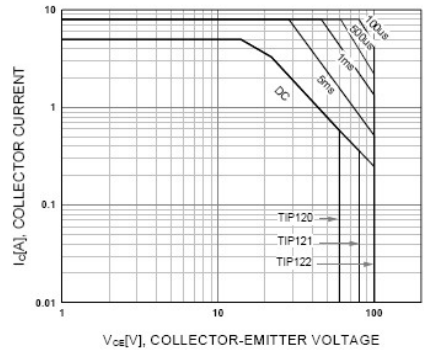

Figure 4. Safe Operating Area

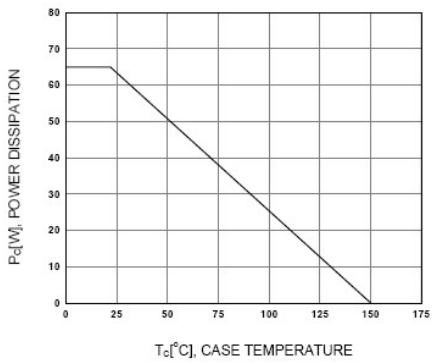

Figure 5. Power Derating

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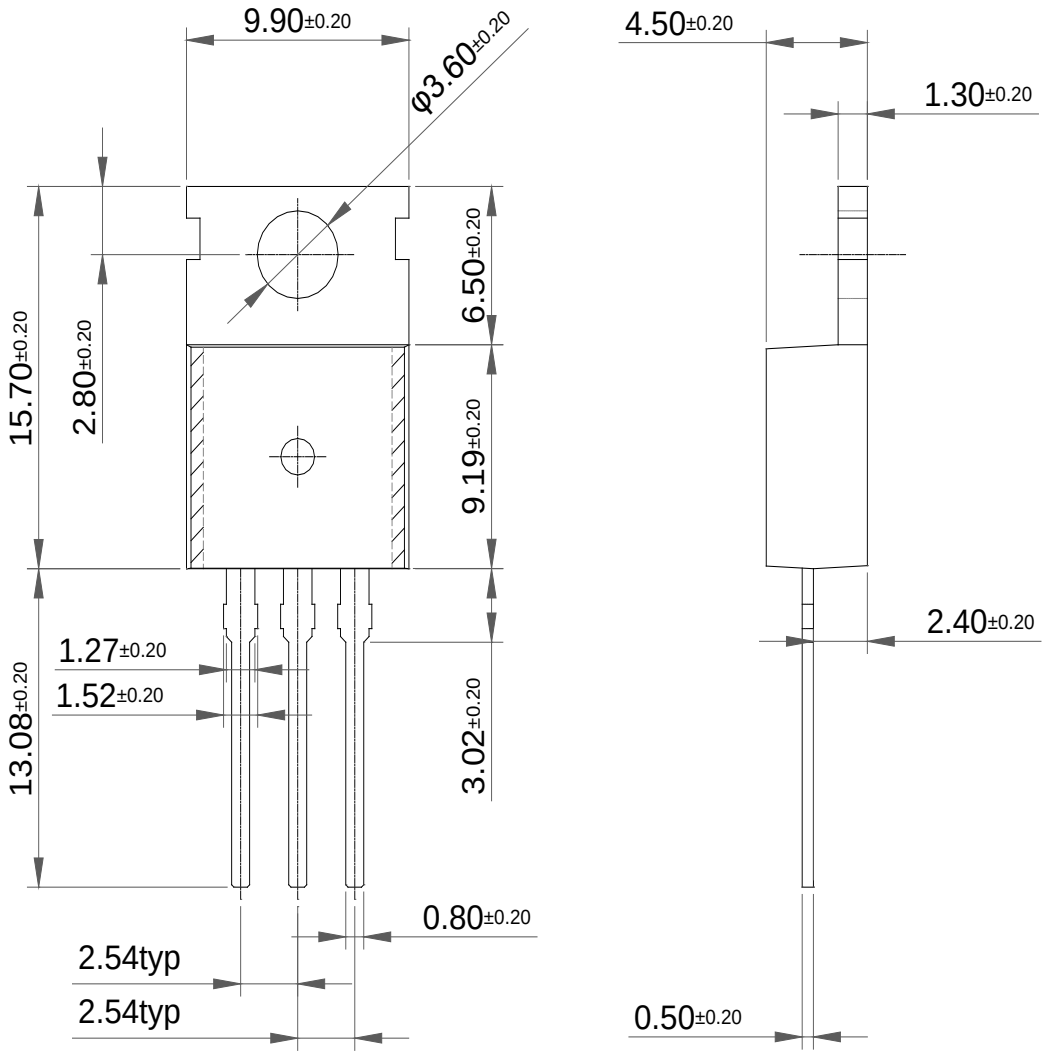
Package Dimension

TO-220 (A)



Dimensions in Millimeters

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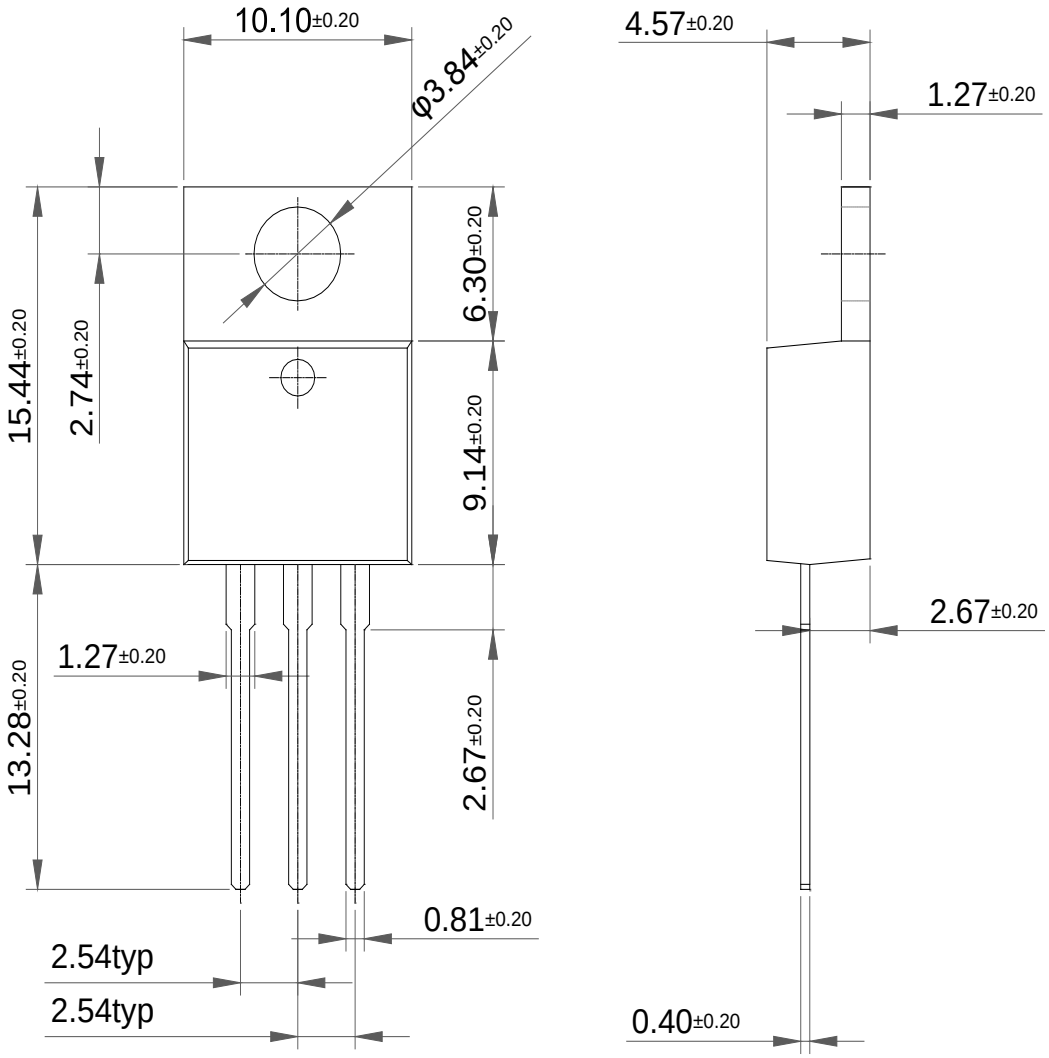
Package Dimension

TO-220 (B)



Dimensions in Millimeters

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